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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,889	03/01/2004	Mary Morabito O'Neill	03W124	2628
7590	03/21/2008		EXAMINER	
Raytheon Company Intellectual Property & Licensing, EO/E04/N119 2000 East El Segundo Boulevard P. O. Box 902 El Segundo, CA 90245			WYATT, KEVIN S	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/790,889	Applicant(s) O'NEILL ET AL.
	Examiner Kevin Wyatt	Art Unit 2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 17 December 2007.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-21 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-21 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is in response to the Amendment after non-final filed 12/17/2007. Currently, claims 1-21 are pending.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 17 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Vock (U.S. Patent No. 6,320,173 B1).

Regarding claim 17, Vock shows in Fig. 6A-B a method for locating a position of a feature in a scene, comprising the steps of forming an image (120, 142e, 152 or 154) of the feature using a segmented array (132, 140 or 150) having a plurality of array subelements, wherein each of the array subelements has an output signal (col. 7, lines 33-40); and cooperatively analyzing the output signals from at least two spatially adjacent array subelements to establish a data set reflective of an extent to which output signals responsive to the image of the feature are produced from exactly one or

from more than one of the adjacent array subelements, and to reach a conclusion from the data set as to a location of the image of the feature on the segmented array (col. 3, 13-25 and col. 7, lines 33-40).

Regarding claim 20, Vock shows in Figs. 6A-B a method wherein the step of providing a sensor (140 or 150) includes the step of providing a two-dimensional segmented array formed of a pattern of square array subelements, wherein four of the square array subelements meet at an intersection point, and wherein the step of forming an image includes the step of forming the image having a diameter of one blur diameter (the slightly blurred image of 142a-e, 152 or 154).

4. Claims 17-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Perregaux (U.S. Patent No. 6,654,056 B1).

Regarding claim 17, Perregaux discloses, a method for locating a position of a feature in a scene (document), comprising the steps of forming an image of the feature using a segmented array (10, i.e., photosensitive chip) having a plurality of array subelements (100, i.e., photosite), wherein each of the array subelements has an output signal; and cooperatively analyzing the output signals (via electronic subsystem (ESS)) from at least two spatially adjacent array subelements to establish a data set reflective of an extent to which output signals responsive to the image of the feature are produced from exactly one or from more than one of the adjacent array subelements and to reach a conclusion from the data set as to a location of the image of the feature on the segmented array (col. 14, lines 28-36).

Regarding claims 18, Perregaux shows in Fig. 4 the step of providing a sensor

(10, i.e., photosensitive chip) includes the step of providing a one-dimensional segmented array formed of pairs of two adjacent array subelements (100, i.e., photosites).

Regarding claim 19, Perregaux shows in Fig. 5, a method wherein the step of providing a sensor includes the step of providing a two-dimensional segmented array formed of a pattern of intersecting array subelements.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 13-15 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hou (U.S. Patent No. 6,596,979 B2) in view of Coufal (Publication No. U.S. 2003/0053221 A1).

Regarding claim 13, Hou shows in Figs. 2A and 10, an imaging sensor system comprising an optics system (208, i.e., rod lens array) that images a point feature of a scene at an image plane having a blur diameter (960, 968, 970, i.e., scanning dots); and a detector array (250, photodetector array) at the image plane, wherein the detector array is a one dimensional detector array or a two-dimensional detector array comprising a plurality of detector subelements, and wherein the detector subelements

are sized responsive to the blur diameter. Hou does not explicitly disclose that the optics system that images a point feature of a scene at an image plane as a blur-circle image having a blur diameter. Coufal discloses that the optics system that images a point feature of a scene at an image plane as a blur-circle image having a blur diameter based on its optics system (paragraph 0089, lines 1-4). It would have been obvious to one skilled in the art to provide an optics system such as the one disclosed in Coufal to the device of Hou for the purpose of addressing the degree of imperfections of optical systems which lead to distortions of a scene imaged by an optical system.

Regarding claim 14, Hou further shows in Fig. 10, the detector subelements are square in plan view (col. 6, lines 39-40).

Regarding claim 15, Hou shows in Fig. 10, the detector subelements are rectangular in plan view (col. 6, lines 39-40).

Regarding claim 16, with respect to the inclusion of further explanation of the previous recitation regarding the specific length and/or dimension of the detector subelements in claims 16, it would have been included in the above discussion in view of "substantially" of the related elements or components, however, if not, it would have been obvious to one of ordinary skill in the art to make a selection of selecting specific or a particular range, size and/or shape of elements combined in the system in order to provide more compact design of the system.

Regarding claim 21, Hou further shows in Fig. 10, that each detector subelement overlaps each of two adjacent detector subelements along their lengths by an amount that is responsive to the blur diameter.

7. Claims 1-5 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carnall, Jr. (U.S. Patent No. 5,065,245) in view of Hou (U.S. Patent No. 6,596,979 B2) and Coufal (Publication No. U.S. 2003/0053221 A1).

Regarding claim 1, Carnall, Jr. shows in Fig. 1 an imaging sensor system (10, i.e., modular image sensor array) a detector array at the image plane, wherein the detector array is a one-dimensional detector array comprising a plurality of detector subelements each having a width of from about 1/2 to about 5 blur diameters, and a length of n blur diameters, wherein each detector subelement overlaps each of two adjacent detector subelements along their lengths, wherein an overlap of each of the two adjacent detector subelements is m blur diameters and a center-to-center spacing of each of the two adjacent detector subelements is n_0 blur diameters, and wherein n is equal to about 3 m and m is equal to about $n_0/2$. Carnall, Jr. does not disclose an optics system that images a point feature of a scene at an image plane as a blur-circle image having a blur diameter. Hou shows in Fig. 2B, an optics system (208, optical lens 274) having a blur diameter (col. 5, lines 27-33), and Coufal discloses imaging a point feature of a scene at an image plane as a blur-circle image (due to inherent imperfections of its optics system, paragraph 0028, lines 1-4). It would have been obvious to one skilled in the art to provide the optics system of Hou and the teachings of Coufal to the device of Carnall, Jr. for the purpose of providing a reliable

Art Unit: 2878

means of focusing and aligning image onto the photodetector array taking into account the realized imperfections of the optics system.

Regarding claims 2-5, Carnall, Jr. further discloses the claimed invention as stated above. In addition, Carnall, Jr. shows in Fig. 1 a) subelements each have a width of about 1 blur diameter; b) n lies in a range of from about $(3m-2)$ to about $(3m+2)$, and m lies in a range of from about $(n_0/2-1)$ to about $(n_0/2+1)$; c) n lies in a range from $(3m-2)$ to $(3m+2)$, and m lies in a range of from $(n_0/2-1)$ to $(n_0/2+1)$; and d) n is equal to $3m$ and m is equal to $n_0/2$. Carnall, Jr. does not disclose an optics system that images a point feature of a scene at an image plane as a blur-circle image having a blur diameter. Hou shows in Fig. 2B, a) an optics system (208, optical lens 274) that images a point feature of a scene at an image plane as a blur-circle image having a blur diameter (col. 5, lines 27-33). It would have been obvious to one skilled in the art to provide the optics system of Hou to the proposed device of Carnall, Jr., discussed above, for the purpose of providing a reliable means of focusing and aligning image onto the photodetector array.

Regarding claims 6-10, with respect to the inclusion of further explanation of the previous recitation regarding the specific length and/or dimension of the detector subelements in claims 6-10, it would have been included in the above discussion in view of "substantially" of the related elements or components, however, if not, it would have been obvious to one of ordinary skill in the art to make a selection of selecting specific or a particular range, size and/or shape of elements combined in the system in order to provide more compact design of the system.

Regarding claim 11, Carnall discloses the claimed invention as stated above. Carnall does not explicitly disclose a scanning mechanism that scans the one-dimensional detector array in a scanning direction perpendicular to the length of the detector subelements. Hou discloses a scanning mechanism that scans the one-dimensional detector array in a scanning direction perpendicular to the length of the detector subelements (col. 5, lines 39-42). It would have been obvious to one skilled in the art to provide a scanning mechanism as stated in Hou to the proposed device of Carnall, discussed above, for the purpose of recording entire image area of object scanned.

Regarding claim 12, Carnall discloses the claimed invention as stated above. Carnall does not explicitly disclose a scanning mechanism that includes a moving platform upon which the one-dimensional detector array is mounted. Hou suggests a scanning mechanism that includes a moving platform upon which the one-dimensional detector array is mounted (col. 5, lines 39-42). It would have been obvious to one skilled in the art to provide a scanning mechanism as stated in Hou to the proposed device of Carnall, discussed above, for the purpose of recording entire image area of object scanned.

Response to Arguments

8. Applicant's arguments filed 12/17/2008 have been fully considered but they are not persuasive.

In response to applicant's arguments regarding claim 17, that col. 3, lines

Art Unit: 2878

13-25 and col. 7, lines 33-40 do not discuss any analysis of the information, that there is no mention of cooperative analysis of the output signals, the examiner disagrees. Vock clearly states 13-25 and col. 7, that composite images (e.g. subsequent frame by frame of captured adjacent pixels) are analyzed. Each frame represents the output resulting from image captured by pixels in the array and stored into memory.

In response to applicant's arguments that there is no disclosure of data sets, no disclosure of establishing the extent to which output signals responsive to the image of the feature are produced from exactly one or more than one of the adjacent array subelements, the examiner disagrees. As previously stated above, col. 3, lines 13-25 and col. 7, lines 33-40 establishes that output signals (from pixels in the array) responsive to the image of the feature (motion tracked from the golf ball are produced by adjacent array subelements (frame by frame).

In response to applicant's arguments that there is no disclosure of the use of the data set to reach a conclusion from the data set as to a location of the image of the feature on the segmented array, the applicant disagrees. Vock suggests at least reaching a conclusion from the data set (composite image or plurality of frames representing outputs of pixels stored and processed by a frame grabber as suggested by Vock in col. 3, lines 13-14) as to a location of the image of the feature on the segmented array by tracking motion of the scene (the traveling golf ball in this case) using the instantaneous field of view (IFOV) of the imaged scene on the pixel array captured frame by frame.

Art Unit: 2878

In response to applicant's arguments regarding claim 20, that there is no disclosure in Vock of blur diameters or one blur diameter, or any concept of blur diameter, that there is no mention of the concept of blur diameter as it related to the apparent size on the detector of a point in the scene, the examiner disagrees. A blur diameter (golf ball) is apparent from the motion of the scene.

In response to applicant's arguments regarding claim 17 that the disclosure does not mention the analysis of spatially adjacent array subelements, establishing of a data set, establishing a data set reflective of an extent to which output signals responsive to the image of the feature are produced from exactly one or more than one of the adjacent array subelements, reaching any type of conclusion, or reaching a conclusion from the data set as to the location of the image of the feature on the segmented array, the examiner disagrees. Perregaux clearly indicates in col. 14, lines 28-36 that processing of the image signals are a result of the detection from each of the photosensitive chips (10). This suggests that conclusions from the data set as to the location of the image of the feature on the segmented array may be reached during processing of image signals from photosensitive chips (10) to perform rendition of image.

In response to applicant's arguments regarding claim 13, that there is no factual basis for the analogy that relates the scanning dot of Hou to the blur diameter claimed by applicant, that Hou does not disclose a blur diameter, and does not disclose or suggest that the photodetectors are sized in any manner responsive to a blur diameter. Lines 1-3 of claim 13 are unpatentable over Hou due to the fact that the scanning dot

Art Unit: 2878

(produced in part by the optics system used by the scanning apparatus, see Fig. 2B) would be considered by those skilled in the art to have an effect of at least slight blurring due to the inherent imperfections in all optical elements at the time of manufacture as described by Coufal in paragraph 0089, lines 1-2. Therefore, characteristically there appears to be no difference between what applicant refers to as a "blur diameter" in claim 13 and in paragraph 0034, and the characteristics of the scanning dots produced an optics system used in Hou.

In response to applicant's arguments that the teachings of Hou cannot be combined with those of Carnall due to different geometries and analytical procedures taught by the two references, that there is no basis for adding in the teachings of Coufal, the examiner disagrees, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation for combining the references suggested above has been filed in the acknowledged motivation generally available to the examiner as one of ordinary skill in the art.

In response to applicant's arguments regarding claim 1, that neither reference teaches or mentions "blur-circle image" or "blur diameter" or the concept of the blurring of a point of light in the scene after passing through the

optics, the examiner disagrees. The examiner disagrees. The term "blur-circle image" or "blur diameter" is not required to be explicitly recited in the prior art as long as the limitations which describe these terms are at least in combination disclosed by these references.

In response to applicant's arguments that neither reference teaches the limitations recited in claim 1, lines 5-7 that there is no location in these references as a source of the teachings, the examiner disagrees. Fig. 1 in Carnall provides the geometry which suggests the limitations for claims 1-5.

In response to applicant's arguments that Coufal provides no teaching of any quantitative expression of optical imperfection or concept of blur circle, the examiner submits that the absence of a quantitative expression does not negate Coufal's assertions of what Coufal states is generally known in the art concerning optics systems.

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Wyatt whose telephone number is (571)-272-5974. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on (571)-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. W./
Examiner, Art Unit 2878

/Georgia Y Epps/

Supervisory Patent Examiner, Art Unit 2878